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10/567,909	10/06/2006	Gregor Herth	7065	7327

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EXAMINER	
KAHN, RACHEL	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,909	HERTH ET AL.	
	Examiner	Art Unit	
	RACHEL KAHN	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/29/09*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim 1 is pending as filed on 6/29/09.

Response to Arguments

Applicant's amendments overcome the following objections and rejections set forth in the office action dated 1/28/09:

The objection to claim 3 is withdrawn, in light of Applicant's cancellation of claim 3.

The rejection of claims 2-6, 8 and 18-20 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen et al (US 2002/0188040) is withdrawn, in light of Applicant's cancellation of the claims.

The rejection of claim 7 as obvious over Chen et al (US 2002/0188040) is withdrawn, in light of Applicant's cancellation of the claim.

The rejection of claim 1 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen et al (US 2002/0188040) is withdrawn. Applicant's amendment to claim 1 incorporating all of the limitations from dependent claims 2-8 have changed the scope of claim 1, necessitating the new rejection set forth below.

Applicant's arguments, as they pertain to amended claim 1, shall be addressed below.

Applicant asserts that Chen's disclosure fails to anticipate or make obvious the limitation of original claim 7 (now incorporated into claim 1), that the first (i.e. intercalated) cationic polymer comprise 20-90 wt% cationic monomers. This argument is unpersuasive.

Chen teaches that the interjacent, or intercalated polymer (corresponding to Applicant's "first" polymer) typically comprises 5-90% of a cationic monomer [0045] and further teaches that the cationic monomer may be present up to 85%, 75% or 60% based on the total monomer composition of the intercalated polymer [0047]. These ranges significantly overlap with the ranges in amended claim 1. In addition, Chen teaches that the cationic monomer is a result effective variable, promoting surface adsorption of the complex onto the solid particles being treated by the complex [0047]. Thusly, even if Applicant does not deem the ranges taught by Chen anticipatory, it would be obvious to one of ordinary skill in the art to adjust the level of cationic monomer based on the intended application and desired level of surface adsorption.

Applicant further argues that Chen describes the host and intercalated polymer in very broad terms. Examiner points out that while Chen does disclose the use of non-

cationic polymers and monomers, Chen provides examples, such as Example 1, page 8, wherein both the host and intercalated polymer are cationic.

Applicant provides a comparison of the inventive polymer composition to the polymer compositions disclosed in EP 262495 (equivalent of US 4835206 to Farrar). Examiner points out that Farrar was not used in a rejection of the instant application. Applicant has not shown that Farrar is closer prior art than Chen, and thusly a showing of unexpected results over Farrar is unpersuasive (see MPEP 716.02(e)I). As explained in Applicant's specification, Farrar discloses a high proportion of host polymer ("coagulant") relative to intercalated polymer ("flocculant") (instant spec, p 2). Chen discloses an example (example 1) wherein the host polymer comprises 18 wt% of the complex, based on the weight of the starting materials. Chen, therefore, discloses compositions wherein the intercalated polymer is in excess relative to the host. As such, comparisons with Farrar can not be used to overcome a rejection over Chen.

Applicant notes that amended claim 1 does not read on compositions prepared from DADMAC, because DADMAC is neither an ester nor amide of methacrylic acid. This argument is unpersuasive, as Chen cites cationized monomers of both esters (METAC) and amides (MAPTAC and MAPTAH) of methacrylic acid [0040 and 0052] for use in preparing the intercalated polymer. Chen also cites poly(meth)acrylamidopropyltrimethyl ammonium halides (amide of methacrylic acid) and

poly(meth)acryloylethyltrimethyl ammonium halides (ester of methacrylic acid) for use as the host polymer [0041].

Applicants arguments regarding the provisional obviousness-type double patenting rejection are unpersuasive. Applicant argues that '664 is patentably distinct from amended claim 1, because '664 recites that the two cationic polymers have different composition in the cationic groups, while instant claim 1 recites that the first and second cationic polymers comprise corresponding structural units.

Examiner disagrees. '664 and instant claim 1 overlap in scope. '664 requires that the two polymers have different composition in the cationic groups, while instant claim 1 broadly recites that the two polymers comprise "corresponding structural units." A "unit" is a very broad limitation, and the instant specification does not narrow the definition of the unit. "Corresponding" is also a very broad term, which is not explicitly defined in the instant specification. Merriam Webster dictionary defines corresponding as (http://www.merriam-webster.com/dictionary/corresponding):

Main Entry: **corresponding**
Function: *adjective*
Date: 1579
1 a : having or participating in the same relationship (as kind, degree, position, correspondence, or function) especially with regard to the same or like wholes (as geometric figures or sets) <corresponding parts of similar triangles> **b** : RELATED, ACCOMPANYING <all rights carry with them corresponding responsibilities — W. P. Paepcke>

Given this definition, two polymers containing quaternized N atoms (regardless of the monomers in which they are contained) could reasonably be considered to contain

"corresponding structural units" as both quaternized N atoms have the same function (providing a positive charge). Claims 4 and 5 of '664 disclose a composition wherein both first and second polymers have quaternized N atoms.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by **Chen** (US 2002/0188040).

Chen discloses intercalated polymer complexes comprising water soluble cationic monomers radically polymerized in water in the presence of a second cationic host polymer in aqueous solution [0020], [example 1, 0080], [example 3, 0084]. The composition disclosed by Chen has the following characteristics:

a) Chen teaches that the two polymers may be made by different methods, resulting in different molecular weight distributions [0063]. The actual molecular weight of the host polymer and the intercalated polymer is determined based on the intended use and properties desired in the interjacent complex [0042]. Chen teaches molecular weight values both below and above 1 million [00042]. Prior art examples of physical mixtures of low molecular weight cationic polymers with high molecular weight cationic

polymers are not stable and tend to separate into two phases [0016-0017]. Chen's interjacent complexes allow the combination of the favorable properties of two polymers (e.g. of high and low molecular weights) without crosslinking [0019-0020].

Chen teaches an embodiment wherein the intercalated polymer may be used as a flocculant for water treatment, while the host polymer is the coagulant [0072]. Preferred molecular weights for the flocculant range from 1,000,000 to 25,000,000, so that the long chains are able to physically bridge from one microscopic particle to another [0069].

b) The two cationic polymers comprise corresponding structural units. In Example 1 (p 8), cationic monomers of diallyldimethylammonium chloride (DADMAC) are radically polymerized (in water) in the presence of a cationic host polymer, polyquaternium-7 (which is a copolymer of acrylamide and DADMAC). The poly-DADMAC formed from the DADMAC monomers is analogous to the "first cationic polymer" of instant claim 1, while the polyquaternium-7 is analogous to the "second cationic polymer." The first and second cationic polymers in Chen's Table 1 have corresponding structural units, as they both contain DADMAC structural units.

In Example 3, host polymer polyquaternium-28, derived from MAPTAC (methacrylamidopropyltrimethyl ammonium chloride) has structural units (acrylamide) which correspond with the acrylamide in the intercalating polymer [0084].

c) In both examples 1 and 3, the intercalated polymer is produced by copolymerization with further water soluble monomers (i.e. non-cationic monomers). In Example 3, both the first and second polymers comprise further water soluble comonomers. Chen cites a number of suitable water soluble monomers which can be used in preparation of the interjacent complex, and notes that one or more may be used [0040]

d) Chen cites cationized monomers of both esters (METAC) and amides (MAPTAC and MAPTAH) of methacrylic acid [0040 and 0052]. Chen also cites poly(meth)acrylamidopropyltrimethylammonium halides (amide of methacrylic acid) and poly(meth)acryloylethyltrimethyl ammonium halides (ester of methacrylic acid) for use as the host polymer [0041].

In Example 3, polyquaternium-28 (the host polymer) comprises MAPTAC. The interjacent polymer comprises acryloyloxyethyl trimethyl ammonium chloride, a cationized ester of (meth)acrylic acid. Both comprise a quaternized N atom.

e) Chen fails to explicitly recite that the first cationic polymer has a lower charge density than the second (host) polymer. However, Chen teaches that the interjacent (first) polymer typically comprises 5-90% cationic, and in some cases 20-50% cationic monomers [0045]. Chen further discloses examples of host polymers which are 100% cationic, such as polyquaternium-6 (100% cationic DADMAC monomers) and polyquaternium-14 (100% cationic methacryloyloxyethyl trimethyl ammonium methyl

sulfate (METAMS) monomers) [0043]. Therefore, a "typical" composition comprising an intercalated polymer having 50-90% cationic monomers and a host polymer of either polyquat-6 or polyquat-14 would fulfill the recitation that the first polymer has a lower cationic charge density than the second polymer.

f) Chen teaches that the interjacent, or intercalated polymer (corresponding to Applicant's "first" polymer) typically comprises 5-90%, and in some cases 20-50%, of a cationic monomer [0045] and further teaches that the cationic monomer may be present up to 85%, 75% or 60% based on the total monomer composition of the intercalated polymer [0047]. These ranges significantly overlap with the ranges in amended claim 1. In Example 3, the interjacent polymer comprises 54% (as calculated by Examiner) cationic monomer.

g) Regarding the limitation of "powdery," Chen teaches that the complexes may be in dry form [0074]. Chen also teaches that the disclosed interjacent polymer complexes provide an improvement over physical mixtures of polymers disclosed in the prior art, which have problems with clumping of dry powder [0017].

h) Regarding the limitation that the polymerization occur according to the process of "adiabatic gel polymerization:" Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. If the product in the product-by-process claim is the same as or obvious from a product of the prior

art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. Furthermore, while Chen does not explicitly teach by example the method of adiabatic gel polymerization recited in instant claim 1, Chen teaches that an adiabatic process can be used to prepare the polymers when a wide molecular weight distribution is desired [0063].

i) Regarding the weight ratio of the second (host) polymer to the first polymer, in Example 1 Chen teaches 2.7% second polymer (polyquat-7) and 39.7% first polymer (poly-DADMAC) [0081]. These values would be the equivalent of a ratio of about 1:15, as calculated by the examiner.

In Example 3, the ratio of second to first polymer is 1:3, as calculated by the Examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Chen** (US 2002/0188040) in view of **Allenson et al** (US 4699951).

The discussion above with regard to the rejection of claim 1 under 35 USC 102(b) over Chen is incorporated herein by reference.

a) If the recitations regarding the molecular weights of the first and second polymers are not considered anticipated by Chen, they are obvious in view of Allenson.

Chen teaches that, in water treatment operations [0069], the intercalated polymer (i.e. first polymer) can be a flocculant polymer having a high molecular weight of 1 million to 25 million. Chen further teaches that waste water treatment applications often involve mixtures of high and low molecular weight cationic polymers [0016], but that physical mixtures of these polymers are not stable and phase separate [0017]. Chen teaches that the combination of the two polymers is desirable, and that Chen's invention allows for a stable, easily prepared and used combination [0019]. Chen fails to expressly disclose the preferred molecular weight of the coagulant (i.e. second) polymer. It could be considered obvious to one of ordinary skill in the art that the "low molecular weight" coagulant averages less than 1 million, in view of Chen's teaching that the "high molecular weight" flocculant averages 1 million to 25 million. However, one of ordinary skill could also look to prior art examples of these high and low molecular weight combinations for guidance (such as Allenson, cited by Chen in [0016]).

Allenson teaches a mixture of cationic polymers for clarifying waste water (col 1, liens 1-12) wherein the first cationic polymer has a preferred weight average of 5000 to 800,000, and the second cationic polymer has a preferred weight average of 5 million to

35 million (col 2, lines 5-21). Allenson teaches that the bimodal molecular weight distribution of the two cationic polymers effectively treats and clarifies contaminated water (col 1, line 65 to col 2, line 4).

Both Chen and Allenson teach a combination of high and low molecular weight cationic polymers for treatment of contaminated waste water, and both Chen and Allenson teach that one of the cationic polymers has a high molecular weight above 1 million. It would be obvious to one of ordinary skill in the art at the time the invention was made to use a lower molecular weight polymer (averaging 5000-800,000) as taught by Allenson, as the coagulant polymer in the composition taught by Chen, in order to produce a bimodal molecular weight distribution to most effectively treat and clarify contaminated waste water.

Example 3 taught by Chen satisfies the recitations of claim 1 regarding types of monomers (esters or amides of (meth)acrylic acid) in both the host and intercalated polymers. The weight ratio of host:interjacent is also fulfilled, as discussed in the 102 rejection above. Chen is silent regarding the molecular weight of the first and second polymers. However, as discussed above, Chen teaches a high molecular weight (above 1 million) intercalated polymer, and it would be obvious, in view of the teachings of Allenson, to use a low molecular weight host polymer for waste water treatment applications.

Chen is also silent regarding the cationic charge density of the host polymer – polyquaternium-28. The intercalated polymer comprises 54 wt% cationic monomers (as

calculated by Examiner), however, it is unclear whether the cationic content of the host polymer fulfills the recitations of instant claim 1 regarding weight % cationic monomer, and cationic charge density relative to the intercalated polymer.

Chen teaches that the cationic monomer is a result effective variable, promoting surface adsorption of the complex onto the solid particles being treated by the complex [0047]. Therefore, it would be obvious to one of ordinary skill in the art to adjust the level of cationic monomer based on the intended application and desired level of surface adsorption. Case law holds that "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." See In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Furthermore, Chen teaches that both copolymers of MAPTAC (eg. polyquaternium-28) as well as homopolymers of MAPTAC are suitable as host polymers [0043, (11) and (17)].

In view of Chen's recognition that polyquat-28 and MAPTAC homopolymer are equivalent and interchangeable as host polymers, it would have been obvious to one of ordinary skill in the art to substitute the polyquat-28 of example 3 with MAPTAC homopolymer and thereby arrive at the present invention (i.e. a composition in which the charge density of the intercalated polymer is lower than the charge density of the host polymer, and one in which the host polymer comprises 100 weight % cationic monomers). Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention;

where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See In re Ruff 118 USPQ 343 (CCPA 1958).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over **claims 1-9 and 19-20** of copending Application No. **10/567664**. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

'664 teaches all of the limitations of instant claim 1. The recitations of molecular weight for the first and second polymers are in '664 claims 2 and 3. The types of

cationic monomers (esters and amides of (meth)acrylic acid) are in claims 4 and 5. The percentage of cationic monomers in the first and second polymers are in claims 7 and 8. The relative charge density is in claim 9.

'664 differs from the instant application in that '664 requires that the two polymers have different composition in the cationic groups ('664 claim 1), while the instant application requires that the two polymers comprise "corresponding structural units." The instant limitation of "corresponding structural units" is very broad. A "unit" is not limited to the cationic groups, nor is a "unit" necessarily an entire monomer. Examiner further points out that "corresponding" is also a very broad term, and is not defined in the instant specification (see response to arguments discussion above).

As discussed above, two polymers containing quaternized N atoms (regardless of the monomers in which they are contained) could reasonably be considered to contain "corresponding structural units" as both quaternized N atoms have the same function (providing a positive charge). Claims 4 and 5 of '664 disclose a composition wherein both first and second polymers have quaternized N atoms.

In another scenario, if the first and second polymers of '664 were copolymerized with, for example, acrylamide (as recited in '664 claim 6 and disclosed as the preferred co-monomer in the specification at p5), the two polymers would contain identical monomer units, and still fulfill the limitation of '664 requiring that the two polymers have different composition in the cationic groups.

Case law holds that those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of

whether a claim in an application defines an obvious variation of an invention claimed in the patent. In re Vogel, 422 F.2d 438, 164 USPQ 619,622 (CCPA 1970).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RACHEL KAHN whose telephone number is (571)270-7346. The examiner can normally be reached on Monday to Friday 8:00 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RACHEL KAHN/
Examiner, Art Unit 1796

Rk

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796